

**421.1 General:** Swimming and bathing pools shall conform to the requirements of 780 CMR 421.0 provided that 780 CMR 421.0 shall not be applicable to any such pool less than 24 inches (610 mm) deep or having a surface area less than 250 square feet (23.25 m<sup>2</sup>), except where such pools are permanently equipped with a water-recirculating system or involve structural materials. For the purposes of 780 CMR, pools are classified as private swimming pools, public swimming pools or *semi-public swimming pools*, as defined in 780 CMR 421.2. Materials and constructions used in swimming pools shall comply with the applicable requirements of 780 CMR.

**421.2 Definitions:** The following words and terms shall, for the purposes of 780 CMR 421.0 and as used elsewhere in 780 CMR, have the meanings shown herein.

**Pools, swimming, hot tubs and spas**

**Above-ground/on-ground pool:** See definition of private swimming pool.

**Barrier:** A fence, a wall, a building wall or a combination thereof which completely surrounds the swimming pool and obstructs access to the swimming pool. (*Refer to M.G.L. c. 140, § 206 for required enclosure of public or semi-public, outdoor, inground swimming pools.*)

**Hot tub:** See definition of private swimming pool.

**In-ground pool:** See definition of private swimming pool.

**Private swimming pool:** Any structure that contains water over 24 inches (610 mm) in depth and which is used, or intended to be used, for swimming or recreational bathing in connection with an occupancy in Use Group R-3 or R-4 and which is available only to the family and guests of the householder. This includes in-ground, above-ground and on-ground swimming pools, hot tubs and spas.

**Private swimming pool, indoor:** Any private swimming pool that is totally contained within a private structure and surrounded on all four sides by walls of said structure.

**Private swimming pool, outdoor:** Any private swimming pool that is not an indoor pool.

**Public outdoor, inground swimming pool:** Any swimming pool which is used, or intended to be used, for swimming or recreational bathing by the general public. *Refer to M.G.L. c. 140, § 206 for requirements pertaining to public or semi-public, outdoor, inground swimming pool enclosures, safety equipment, inspection, and penalties for violations.*

**Public swimming pool, outdoor:** Any public swimming pool that is not defined as an outdoor, inground swimming pool.

**Semi-public outdoor, inground swimming pool:** (as defined by M.G.L. c. 140, § 206) any

*swimming or wading pool on the premises of, or used in connection with, a hotel, motel, trailer court, apartment house, country club, youth club, school, camp, or similar establishment where the primary purpose of the establishment is not the operation of the swimming facilities. Semi-public outdoor, inground swimming pool shall also mean a pool constructed and maintained by groups for the purposes of providing bathing facilities for members and guests only. Refer to M.G.L. c. 140, § 206 for requirements pertaining to public or semi-public, outdoor, inground swimming pool enclosures, safety equipment, inspection, and penalties for violations.*

**Semi-public swimming pool, outdoor:** Any semi-public swimming pool that is not defined as a semi-public outdoor, inground swimming pool.  
**Spa:** See definition of private swimming pool.

**421.3 Permits and construction documents:** A swimming pool or appurtenances thereto shall not be constructed, installed, enlarged or altered until construction documents have been submitted and a permit has been obtained from the code official. The approval of all city, county and state authorities having jurisdiction over swimming pools shall be obtained before applying to the code official for a permit. Certified copies of these approvals shall be filed as part of the supporting data for the permit application.

**421.3.1 Construction documents:** Construction documents shall accurately show dimensions and construction of the pool and appurtenances and properly established distances to lot lines, buildings, walks and fences, as well as details of the water supply system, drainage and water disposal systems, and all appurtenances pertaining to the swimming pool. Detailed construction documents of structures, vertical elevations and sections through the pool showing depth shall be included.

**421.4 Locations:** Private swimming pools shall not encroach on any front or side yard required by 780 CMR or by the governing zoning law, unless in accordance with specific rules of the jurisdiction in which the pool is located. A wall of a swimming pool shall not be located less than six feet (1829 mm) from any rear or side property line or ten feet (3048 mm) from any street property line, unless in accordance with specific rules of the jurisdiction in which the pool is located.

**421.5 Structural design:** The pool structure shall be engineered and designed to withstand the expected forces to which the pool will be subjected.

**421.5.1 Wall slopes:** To a depth up to two feet nine inches (838 mm) from the top, the wall slope

shall not be more than one unit horizontal in five units vertical (1:5).

**421.5.2 Floor slopes:** The slope of the floor on the shallow side of the transition point shall not exceed one unit vertical to seven units horizontal (1:7). For public pools greater than 1,200 square feet (111.6 m<sup>2</sup>), the slope of the floor on the shallow side of the transition point shall not exceed one unit vertical to ten units horizontal (1:10). The transition point between shallow and deep water shall not be more than five feet (1524 mm) deep.

**421.5.3 Surface cleaning:** All swimming pools shall be provided with a recirculating skimming device or overflow gutters to remove scum and foreign matter from the surface of the water. Where skimmers are used for private pools, there shall be at least one skimming device for each 1,000 square feet (93 m<sup>2</sup>) of surface area or fraction thereof. For public pools where water skimmers are used, there shall be at least one skimming device for each 600 square feet (55.8 m<sup>2</sup>) of surface area or fraction thereof. Overflow gutters shall not be less than three inches (76 mm) deep and shall be pitched to a slope of one unit vertical to 48 units horizontal (1:48) toward drains, and constructed so that such gutters are safe, cleanable and that matter entering the gutters will not be washed out by a sudden surge of entering water.

**421.5.4 Walkways:** All public and semi-public swimming pools shall have walkways not less than four feet (1219 mm) in width extending entirely around the pool. Curbs or sidewalks around any swimming pool shall have a slip-resistant surface for a width of not less than one foot (305 mm) at the edge of the pool, and shall be so arranged as to prevent return of surface water to the pool.

**421.5.5 Steps and ladders:** At least one means of egress shall be provided from private pools. All public and semi-public pools shall provide ladders to other means of egress at both sides of the diving section and at least one means of egress at the shallow section; or at least one means of egress in the deep section and the shallow section if diving boards are not provided. Treads of steps and ladders shall have slip-resistant surfaces and handrails on both sides, except that handrails are not required where there are not more than four steps or where the steps extend the full width of the side or end of the pool. (Refer to 521 CMR 19.00, the Architectural Access Board's rules and regulations, for requirements pertaining to the accessibility of all public and semi-public swimming pools.)

**421.6 Watersupply:** All swimming pools shall be provided with a potable water supply, free of cross connections with the pool or its equipment.

**421.6.1 Water treatment:** All public and semi-public swimming pools shall be designed and installed so that there is a pool water turnover at least once every eight hours. Filters shall not filter water at a rate in excess of three gallons per minute per square foot (0.0020 m<sup>3</sup>/s m<sup>2</sup>) of surface area. The treatment system shall be designed and installed so that at all times when the pool is occupied, the water is provided with excess chlorine of not less than 0.4 parts per million (ppm) or more than 0.6 ppm, or excess chloramine between 0.7 and 1.0 ppm, or disinfection shall be provided by other approved means. Acidity/alkalinity of the pool water shall not be below 7.0 or more than 7.5. All recirculating systems shall be provided with an approved hair and lint strainer installed in the system ahead of the pump.

Private swimming pools shall be designed and installed so that there is a pool water turnover at least once every 18 hours. Filters shall not filter water at a rate in excess of five gallons per minute per square foot (0.0034 m<sup>3</sup>/s m<sup>2</sup>) of surface area. The pool owner shall be instructed in the care and maintenance of the pool by the supplier or builder, including treatment with high-test calcium hypochlorite (dry chlorine), sodium hypochlorite (liquid chlorine) or equally effective germicide and algicide, and the importance of proper pH (alkalinity and acidity) control.

**421.6.2 Drainage systems:** The swimming pool and equipment shall be equipped to be emptied completely of water and the discharged water shall be disposed of in an approved manner that will not create a nuisance to adjoining property.

**421.7 Appurtenant structures:** All appurtenant structures, installations and equipment, such as showers, dressing rooms, equipment houses or other buildings and structures, including plumbing, heating and air conditioning systems, shall comply with all applicable requirements of 780 CMR, applicable zoning laws and requirements, 105CMR 435.000: Minimum Standards for Swimming Pools (State Sanitary Code: Chapter V), 248 CMR 2.00 : the State Plumbing Code, and 527 CMR 12.00: the State Electrical Code.

**421.7.1 Accessories:** All swimming pool accessories shall be designed, constructed and installed so as not to be a safety hazard. Installations or structures for diving purposes shall be properly anchored to insure stability.

**421.8 Equipment installations:** Pumps, filters and other mechanical and electrical equipment for public swimming pools shall be enclosed in such a manner as to provide access only to authorized persons and not to bathers. Construction and drainage shall be arranged to avoid the entrance and accumulation of water in the vicinity of electrical equipment.

**421.9 Enclosures for outdoor, inground public and semi-public swimming pools:** *Outdoor, inground public semi-public swimming pools shall be provided with an enclosure in accordance with M.G.L. c. 140, § 206.*

**421.9.1 Enclosure for public and semi-public outdoor, inground swimming pools:** *Every public and semi-public outdoor, inground swimming pool shall be enclosed by a fence six feet in height and firmly secured at ground level provided that any board or stockade fence or structure shall be at least five feet in height, but if over five feet in height, the fence shall be chain link. Such enclosure, including gates therein, shall not be less than six feet above the ground, and any gate shall be self-latching with latches placed four feet above the ground or otherwise made inaccessible from the outside to children up to eight years of age. Such enclosure shall be constructed of such material and maintained so as not to permit any opening in said enclosure, other than a gate, wider than three inches at any point along the enclosure. Any such pool shall be equipped with at least one life ring and rescue hook.*

**421.9.1.1 Enclosure for all other public and semi-public swimming pools:** *The enclosure shall extend not less than four feet (1219 mm) above the ground. All gates shall be self-closing and self-latching with latches placed at least four feet (1219 mm) above the ground.*

**421.9.2 Construction of enclosure for all other public and semi-public swimming pools:** *Enclosure fences shall be constructed so as to prohibit the passage of a sphere larger than four inches (102 mm) in diameter through any opening or under the fence. Fences shall be designed to withstand a horizontal concentrated load of 200 pounds (91 kg) applied on a one-square-foot (0.093 m<sup>2</sup>) area at any point of the fence.*

**421.9.3 Alternative devices:** *A natural barrier, pool cover or other protective device approved by the governing body shall be an acceptable enclosure as long as the degree of protection afforded by the substituted device or structure is not less than the protection afforded by the enclosure, gate and latch described herein.*

**421.10 Enclosures for private swimming pools, spas and hot tubs:** *In lieu of any zoning laws or ordinances to the contrary, private swimming pools, spas and hot tubs shall be enclosed in accordance with 780 CMR 421.10.1 through 421.10.4 or by other approved barriers.*

**421.10.1 Outdoor private swimming pool:** *An outdoor private swimming pool, including an inground, aboveground or on-ground pool, hot tub*

*or spa shall be provided with a barrier which shall comply with the following.*

1. The top of the barrier shall be at least 48 inches (1219 mm) above finished ground level measured on the side of the barrier which faces away from the swimming pool. The maximum vertical clearance between finished ground level and the barrier shall be two inches (51 mm) measured on the side of the barrier which faces away from the swimming pool. Where the top of the pool structure is above finished ground level, such as an above-ground pool, the barrier shall be at finished ground level, such as the pool structure, or shall be mounted on top of the pool structure. Where the barrier is mounted on top of the pool structure, the maximum vertical clearance between the top of the pool structure and the bottom of the barrier shall be four inches (102 mm).

2. Openings in the barrier shall not allow passage of a four-inch (102 mm) diameter sphere.

3. Solid barriers shall not contain indentations or protrusions except for normal construction tolerances and tooled masonry joints.

4. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is less than 45 inches (1143 mm), the horizontal members shall be located on the swimming pool side of the fence. Spacing between vertical members shall not exceed 1 1/4 inches (44 mm) in width. Decorative cutouts shall not exceed 1 1/4 inches (44 mm) in width.

5. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is 45 inches (1143 mm) or more, spacing between vertical members shall not exceed four inches (102 mm). Decorative cutouts shall not exceed 1 1/4 inches (44 mm) in width.

6. Maximum mesh size for chain link fences shall be a 1 1/4-inch (32 mm) square unless the fence is provided with slats fastened at the top or the bottom which reduce the openings to not more than 1 1/4-inches (44 mm).

7. Where the barrier is composed of diagonal members, such as a lattice fence, the maximum opening formed by the diagonal members shall be not more than 1 1/4 inches (44 mm).

8. Access gates shall comply with the requirements of 780 CMR 421.10.1 items 1 through 7, and shall be equipped to accommodate a locking device. Pedestrian access gates shall open outwards away from the pool and shall be self-closing and have a self-latching device. Gates other than pedestrian access gates shall have a self-latching device. Where the release mechanism of the self-latching device is located less than

## THE MASSACHUSETTS STATE BUILDING CODE

54 inches (1372 mm) from the bottom of the gate: (a) the release mechanism shall be located on the pool side of the gate at least three inches (76 mm) below the top of the gate; and (b) the gate and barrier shall not have an opening greater than ½ inch (13 mm) within 18 inches (457 mm) of the release mechanism.

9. Where a wall of a dwelling serves as part of the barrier, one of the following shall apply:

9.1. All doors with direct access to the pool through that wall shall be equipped with an alarm which produces an audible warning when the door and its screen, if present, are opened. The alarm shall sound continuously for a minimum of 30 seconds immediately after the door is opened. The alarm shall have a minimum sound pressure rating of 85 dBA at ten feet (3048 mm) and the sound of the alarm shall be distinctive from other household sounds such as smoke alarms, telephones and door bells. The alarm shall automatically reset under all conditions. The alarm shall be equipped with manual means, such as touchpads or switches, to deactivate temporarily the alarm for a single opening from either direction. Such deactivation shall last for not more than 15 seconds. The deactivation touchpads or switches shall be located at least 54 inches (1372 mm) above the threshold of the door.

9.2. The pool shall be equipped with an approved power safety cover.

10. Where an above-ground pool structure is used as a barrier or where the barrier is mounted on top of the pool structure, and the means of access is a fixed or removable ladder or steps, the ladder or steps shall be surrounded by a barrier which meets the requirements of 780 CMR 421.10.1 items 1 through 9. A removable ladder shall not constitute an acceptable alternative to enclosure requirements.

**421.10.2 Indoor private swimming pool:** All walls surrounding an indoor private swimming pool shall comply with 780 CMR 421.10.1, item 9.

**421.10.3 Prohibited locations:** Barriers shall be located so as to prohibit permanent structures, equipment or similar objects from being used to climb the barriers.

**421.10.4 Exemptions:** The following shall be exempt from the provisions of 780 CMR 421.0.

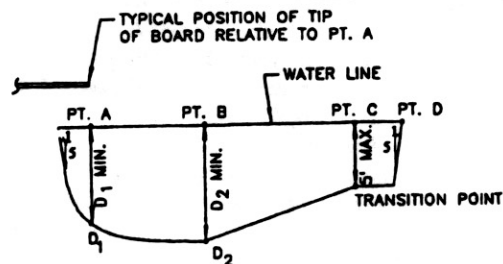
1. A spa or hot tub with an approved safety cover.
2. Fixtures which are drained after each use.

**421.11 Diving boards:** Minimum water depths and distances for diving hoppers for pools, based on board height above water, shall comply with Table

421.11(1) for public pools and Table 421.11 (2) for private pools.

The maximum slope permitted between point D<sub>2</sub> and the transition point shall not exceed one unit vertical to three units horizontal (1:3) in private and public pools. D<sub>1</sub> is the point directly under the end of the diving boards. D<sub>2</sub> is the point at which the floor begins to slope upwards to the transition point. See Figure 421.11.

**Figure 421.11**  
**MINIMUM WATER DEPTHS AND**  
**DISTANCES BASED ON BOARD HEIGHT**  
**FOR ALL PUBLIC, SEMI PUBLIC AND**  
**PRIVATE POOLS**



**Table 421.1 1(1)**  
**MINIMUM WATER DEPTHS AND**  
**DISTANCES BASED ON BOARD**  
**HEIGHT FOR ALL PUBLIC POOLS**

Board height	Minimum depth <sup>a</sup> at D <sub>1</sub> directly under end of board	Distance <sup>a</sup> between D <sub>1</sub> and D <sub>2</sub>	Minimum depth <sup>a</sup> at D <sub>2</sub>
2'2" (¾ meter)	7'0"	8'0"	8'6"
2'6" (¾ meter)	7'6"	9'0"	9'0"
1 meter	8'6"	10'0"	10'0"
3 meter	11'0"	10'0"	12'0"

Note a. 1 foot = 304.8 mm.

**Table 421.11(2)**  
**MINIMUM WATER DEPTHS AND**  
**DISTANCES BASED ON BOARD HEIGHT**  
**FOR PRIVATE POOLS**

Board height	Minimum depth <sup>a</sup> at D <sub>1</sub> directly under end of board	Distance <sup>a</sup> between D <sub>1</sub> and D <sub>2</sub>	Minimum depth <sup>a</sup> at D <sub>2</sub>
1'8" (½ meter)	6'0"	7'0"	7'6"
2'2" (¾ meter)	6'10"	7'6"	8'0"
2'6" (¾ meter)	7'5"	8'0"	8'0"
3'4" (1 meter)	8'6"	9'0"	9'0"

Note a. 1 foot = 304.8 mm.

**780 CMR 421.0 SWIMMING POOLS**  
(Refer to M.G.L. c. 140, § 206 for further requirements pertaining to public or semi-public, outdoor, inground swimming pool enclosures, safety equipment, inspection, and penalties for violations.)



ENERGY CONSERVATION APPLICATION FORM FOR  
LOW-RISE RESIDENTIAL NEW CONSTRUCTION and ADDITIONS  
780 CMR Appendix J (effective 3/1/98)

Applicant Name: \_\_\_\_\_  
Applicant Address: \_\_\_\_\_  
\_\_\_\_\_

Site Address: \_\_\_\_\_  
City/town: \_\_\_\_\_  
Use Group: \_\_\_\_\_  
Date of Application: \_\_\_\_\_  
Applicant Signature: \_\_\_\_\_

Applicant Phone: \_\_\_\_\_

Compliance Path (check one):

☐ **Prescriptive Package (Limited to 1- or 2-family wood frame buildings heated with fossil fuels only)**

Package (A through KK from Table J5.2.1b): \_\_\_\_\_ Heating Degree Days (HDD65) from Table J5.2.1a: \_\_\_\_\_

(For items d. through I., fill in all values that apply from Table J5.2.1b:)

a. Gross Wall Area	_____ sq.ft	f. Wall R-value	R-_____
b. Glazing Area'	_____ sq.ft.	g. Floor R-value	R-_____
c. Glazing % (100 x b + a)	_____ %	h. Basement wall	R-_____
d. Glazing U-value	U-_____	i. Slab Perimeter	R-_____
e. Ceiling R-value	R-_____	j. Heating AFUE	_____

☐ **Component Performance: 'Manual Trade-Off' (Limited to wood or metal framed buildings only)**

Climate Zone (from Figure J6.2.2) ☐ Zone 12 ☐ Zone 13 ☐ Zone 14

Attach *Trade-Off Worksheet* from Appendix J, [and *HVAC Trade-Off Worksheet*, if applicable]

☐ **MAScheck Software**

Attach Compliance Report and Inspection Checklist printouts.

☐ **Home Energy Rating System Evaluation**

Attach Home Energy Rating Certificates (HERS rating score must be 83 or higher)

☐ **Systems Analysis** OR ☐ **Renewable Energy Sources**

Attach Mass Registered Architect or Engineer Analysis

**ALTERNATIVE FOR ADDITIONS ONLY:**

a. Gross Wall + Ceiling Area \_\_\_\_\_ sq.ft. b. Glazing Area' \_\_\_\_\_ sq.ft. c. Glazing % (100 x b + a) \_\_\_\_\_ %

☐ **ADDITION with Glazing % (c.) up to 40% may use 780 CMR Table JI.1.2.3.1 below:**

Maximum U-value	MINIMUM R-Values				
Fenestration	Ceiling	Wall	Floor	Basement Wall	Slab Perimeter, Depth
0.39	R-37	R-13	R-19	R-10	R-10, 4 ft.

- 1 Glazing Area may be either Rough Opening or Unit dimensions.
- 2 Based on NFRC listing. Applies either to every unit, or to area-weighted average of all units.
- 3 R-30 ceiling insulation may be used in place of R-37 if the insulation achieves the full R-value over the entire ceiling area. (i.e. – not compressed over exterior walls, and including any access openings.)

☐ **"SUNROOM" addition (greater than 40% glazing-to-wall and ceiling gross area)**

Attach "Consumer Information Form" from 780 CMR Appendix B.

Official's Name: \_\_\_\_\_

Official's Signature \_\_\_\_\_

Application Approved ☐ Denied ☐

Date of Approval/Denial: \_\_\_\_\_

Reason(s) for Denial: (provide additional details as needed on back side)